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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,675	01/07/2004	Alexander S. Kozlov	H0005756-1060	1132

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EXAMINER	
WILKINS III, HARRY D	
ART UNIT	PAPER NUMBER
1742	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/14/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/753,675	KOZLOV ET AL.	
	Examiner	Art Unit	
	Harry D. Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-25 and 27-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-25 and 27-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. The claim rejection under 35 USC 102 of claims 15, 19 and 22-25 based on Alperine et al has been withdrawn in view of Applicant's amendment to those claims requiring deposition of the particles at the same time as the electroplating of platinum.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-5, 7-25 and 27-30 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant failed to show possession of the claim limitation that the thickness of the electroplated layer had a thickness of less than about 10 microns. The only disclosure of such a thickness appears in paragraph [0047] of the specification as filed, and teaches that the final platinum-aluminide coating had a thickness of 5-100 microns, typically in the range of 10 to 70 microns, and usually in the range of from about 20 to 50 microns. Applicant has failed to show where support for such a limitation comes from the specification as filed.

Applicant's recitation in paragraph [0076] of the specification as filed is noted, however, a statement that the "thickness of the Pt + Cr electroplated layer is **mostly**

less than about 10 microns" [emphasis added] is not considered a clear teaching that the thickness of the electroplated layer be completely less than 10 microns as required by the claims, since the word "mostly" implies that there were significant portions of the electroplated layer that had a thickness above 10 microns.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5, 7-12, 15-19, 22-25, 27 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alperine et al (US 6,183,888) in view of Honey et al (US 4,810,334).

Alperine et al teach (see abstract, figure 1 and cols. 5-7) a method of forming a coating on a substrate include the steps of (1) depositing particles of a material containing chromium (e.g.-MCrAlY) onto a substrate and (2) electroplating platinum, with an addition of a supplemental metal, e.g.-Rh or Ni, onto the substrate to fix the MCrAlY particles onto the surface of the substrate.

Thus, the difference between the disclosure of Alperine et al and the presently claimed invention is that Alperine et al teach depositing the particles as a separate step from the electroplating step.

However, it has been held previously, see *In re Tatincloux* (108 USPQ 125 (1955)) and *In re Freed* (165 USPQ 570 (1970)), that in certain instances it would be

obvious to one of ordinary skill in the art to perform two steps, which in the prior art were performed in sequence, in a simultaneous manner. However, as per *In re* Freed an evaluation of facts is necessary.

In support of the conclusion of obviousness, the Examiner cites Honey et al, which teaches a step of electroplating, wherein MCrAlY particles are co-deposited during an electroplating step.

As such, the prior art provides a reasonable expectation of successfully performing the platinum electroplating step of Alperine et al simultaneously with the deposition of the MCrAlY particles.

With respect to the amended feature that the particles of the supplementary constituent had a mean paticle diameter ranging between 1 micron and 10 microns, Alperine et al teach (se col. 6, lines 9-10) that the preferred particles size was 4-15 microns.

With respect to the amended feature that the electroplated layer had a thickness of less than about 10 microns, **either** the process of Alperine et al in view of Honey et al inherently produced a layer having a thickness less than 10 microns (i.e.-at a given point in time after initiation of the electroplating current, until the process proceeded to achieve a deposited layer of thickness greater than 10 microns) since the claims do not exclude further processing steps to increase the layer thickness **or** it would have been obvious to one of ordinary skill in the art to have optimized the total thickness of the coating layer within the range of less than 100 microns as taught by Alperine et al (see col. 4, lines 54-58) in order to maximize the protective properties of the coating (see

Alperine et al, col. 4, lines 30-36), while minimizing the weight gain caused by the coating (see Alperine et al, col. 4, lines 19-22). Further, Applicant has not demonstrated or argued that the claimed thickness of the coating layer produced an unexpected result.

With respect to the amended feature of claims 15 and 27 that the electrolyte for electroplating included a platinum salt, it is considered entirely common knowledge within the art of electroplating that salts of the metal to be electroplated were required for electroplating from "electrolytic deposition baths". Such statement of common knowledge is supported by the disclosure of Strangman et al. Electroplating occurs by the reduction of metal ions to base metal at the workpiece (in this instance the cathode), the reduction occurring by a supply of electrons provided by a power supply.

Regarding claim 2, the particles of Alperine et al and Honey et al contained Al, Cr and Y as well as one or more of Ni, Co and Fe.

Regarding claim 3, the particles of Alperine et al and Honey et al contained chromium.

Regarding claim 4, since chromium spontaneously reacts with air to form oxides, the particles of Alperine et al and Honey et al are considered to inherently include at least some chromium oxide. The particles further contained reactive elements Al and Y.

Regarding claim 5, the particles of Alperine et al and Honey et al contained an alloy of chromium with Al and Y and one or more of Ni, Co and Fe.

Regarding claim 7, Alperine et al teach (see col. 5) that the particles comprised powder of chromium, aluminum, yttrium and one or more of Ni, Co and Fe.

Regarding claim 8, Alperine et al teach (see col. 7, lines 46-56) that after forming the Pt-MCrAlY coating, it may be subjected to a conventional aluminizing process. Additionally, there is (see col. 7, lines 18-45) a heating step to promote interdiffusion of the deposited layer with the substrate and that such interdiffusion also occurs during the aluminizing process.

Regarding claim 9, Alperine et al teach (see col. 7, lines 18-45) a heating step to promote interdiffusion of the deposited layer with the substrate.

Regarding claim 10, Alperine et al, as supported by Honey et al, teach electroplating platinum metal onto a substrate via an electrolyte and concurrently performing electrophoretic deposition of particles form the electrolyte, wherein the particles were made of MCrAlY, where M is one or more of Ni, Co and Fe.

Regarding claim 11, Honey et al teach that the concurrent deposition process provides the particles entrapped throughout the electroplated metal layer.

Regarding claim 12, the particles included chromium.

Regarding claim 15, Alperine et al teach (see abstract, figure 1 and cols. 5-7) a method for preparing a coated component including <1> providing a substrate (10), <2> electroplating a metal layer (12) on a surface of the substrate, wherein the electroplated metal layer comprised platinum metal and particles (11) of a supplementary constituent entrapped within the platinum metal, wherein the supplementary constituent included Cr, Al, Y and one or more of Ni, Co and Fe, <3> depositing aluminum onto the electroplated metal layer and <4> forming a platinum aluminide coating on the substrate, wherein the platinum aluminide coating included the supplementary

constituent. In view of the teachings of Honey et al, it would have been obvious to one of ordinary skill in the art to have provided an electrolyte for co-deposition of platinum with the particles.

Regarding claim 16, Alperine et al, as supported by Honey et al, suggest co-deposition of the platinum and the particles.

Regarding claim 17, the particles would have been maintained in suspension as suggested for the electrophoretic deposition of particles (see col. 6 of Alperine et al).

Regarding claim 18, it would have been within the ability of one of ordinary skill in the art to have selected on optimum concentration of particles within the electrolyte in order to achieve the desired ratio of platinum to particles in the electroplated layer.

Regarding claims 19 and 22-23, Alperine et al teach (see col. 7) step 3 of heating after the electroplating step and before the aluminizing step. The heating occurs at temperatures of 750-1250°C and is sufficient to cause interdiffusion of the coating with the substrate.

Regarding claim 24, the substrate of Alperine et al was a superalloy and the aluminizing step was at a sufficient enough temperature to cause formation of a platinum-aluminide coating.

Regarding claim 25, the aluminization occurred at high temperatures, such as 1100°C (see Example 1).

Regarding claim 27, as above Alperine et al as supported by Honey et al teach the steps as claimed. It is noted that steps (e) and (f) occur simultaneously in the process of Alperine et al.

Regarding claim 29, the particles of Alperine et al and Honey et al included Cr, Al and Y.

Regarding claim 30, although not taught by Honey et al, Alperine et al teach performing agitation during an electrophoretic process of particle deposition to avoid conglomeration of the particles.

6. Claims 13, 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alperine et al (US 6,183,888) in view of Honey et al (US 4,810,334) as applied to claims 10 and 27 above, and further in view of Strangman et al (US 6,306,277).

Alperine et al is silent with respect to the details of the platinum electroplating process, assuming that one of ordinary skill in the art would have been capable of selecting an appropriate electrolyte and operating parameters.

Strangman et al teach (see abstract and claims) a process of electroplating platinum utilizing an electrolyte comprising dinitrodiamine platinum at voltages of 0.2-6.0 V. The process was able to reduce contaminants in the electroplated platinum layer.

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized the electrolyte and operating voltage as taught by Strangman et al for the platinum electroplating step of Alperine et al because Strangman et al teach that the process reduced impurities in the electroplated platinum layer.

7. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alperine et al (US 6,183,888) in view of Honey et al (US 4,810,334) as applied to claims 15 and 19 above, and further in view of Adams, Jr (US 154,435).

Alperine et al teach a post-electroplating heat treatment, but that heat treatment causes interdiffusion of the platinum with the substrate and occurs at temperatures outside the range of claim 21.

Adams, Jr teach the concept of applying a moderate heat treatment to an article coated by electroplating to reduce the occurrence of "stripping" of the electroplated layer.

Therefore, it would have been obvious to one of ordinary skill in the art to have applied a heat treatment as taught by Adams, Jr to the process of Alperine et al to improve the bonding between the substrate and the electroplated platinum to reduce the occurrence of "stripping".

Response to Arguments

8. Applicant's arguments filed 30 January 2007 have been fully considered but they are not persuasive. Applicant has argued that:

a. Alperine et al discloses a process of electrolytic deposition wherein the electrolytic bath is either pure platinum or a platinum alloy, and does not include a platinum salt.

In response, electrolytic deposition of platinum cannot occur from an electrolytic bath of pure metal. As noted in the rejection grounds above, electrolytic deposition (i.e.-electroplating) occurs by reduction of metal ions (i.e.-a metal cation, necessarily requiring an anion, which in combination for a metal salt) at the workpiece, the reduction occurring by a supply of excess electrons at the workpiece provided by an electric power supply.

b. The feature of a total layer thickness of less than about 10 microns with particles having a thickness ranging between 1 micron and 10 microns was not expected to be obtainable because it was not thought that a thin platinum layer would be able to entrap the particles.

In response, such argument is not supported by facts. In contrast, the prior art teaches a reasonable expectation of successfully co-depositing a layer of platinum by electroplating and MCrAlY particles by electrophoresis to for composite layers of platinum metal and discrete MCrAlY particles. Nothing in the prior suggests that layers thinner than the 20-200 microns taught by Alperine et al at col. 6, lines 45-51) would not have been capable of being produced, particularly because the layers formed by the process of Alperine et al in view of Honey et al start at a thickness of zero microns and build up over time to the final overall thickness. Thus, the process could have been stopped at any desired time after initiation.

c. Alperine et al "fails to disclose any type of particles entrapped in an electroplated layer".

In response, as can be seen from figure 1 of Alperine et al, this is clearly not true. The electroplated layer 12 included entrapped particles 11. The difference being that Alperine et al does not co-deposit the entrapped particles with the electroplated platinum.

d. Honey et al teaches forming layers having thicknesses in the range of 25 to 150 microns.

In response, it should be noted that the cited lines from Honey et al are not directed to the co-deposited metal-particle layer. The co-deposited metal-particle layer is discussed in col. 2, lines 28-49. Although the formed co-deposited metal-particle layer in Honey et al falls in the range of 76-127 microns (0.076-0.127 mm), there is no suggestion or teaching that thicker or thinner layers could not be made, merely that the disclosed thicknesses were the preferable range for that specific embodiment. Thus, there is still a reasonable expectation to one of ordinary skill in the art to be able to successfully form thin layers.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Harry D Wilkins, III
Primary Examiner
Art Unit 1742

hdw